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PLAN OF ACTION NAVAL ASSESSMENT AND CONTROL OF INSTALLATION POLLUTANTS VERIFICATION STUDY NAS KEY WEST FL

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PLAN OF ACTION
NAVAL ASSESSMENT AND CONTROL OF INSTALLATION POLLUTANTS, VERIFICATION STUDY, NAS-KEY WEST, FLORIDA

Prepared for

NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
Charleston, South Carolina

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INTRODUCTION

As part of the Naval Assessment and Control of Installation Pollutants Program (NACIP), an Initial Assessment Study (IAS) was performed at the Naval Air Station - Key West and associated Naval activities in Key West, Florida. This program, administered by the Naval Energy and Environmental Support Activity, is designed to identify potential environmental contamination resulting from past hazardous materials management. The findings of the IAS were presented in a report dated May 1985, entitled: "Initial Assessment Study of Naval Air Station, Key West, Florida." Based on the findings of the study, it was determined that six sites, shown in Figure 1, required further evaluation in order to assess their potential long-term impacts to the environment and public health.

In addition, three other sites, also shown in Figure 1, have been recommended for investigation based on information collected after the completion of the IAS report. Although not originally recommended by the IAS, the Fleming Key North Landfill (Site No. 7) has been added due to comments raised by the FDER (Florida Department of Environmental Regulation) and a site visit by G&M (Geraghty & Miller, Inc.) and Navy personnel on October 15, 1985. Also, the bulk fuel storage area (Site No. 9) at Trumbo Point Annex and the Fire-Fighting Training Area on Boca Chica Key (Site No. 10) have been recommended for study. A previous study was conducted by G&M

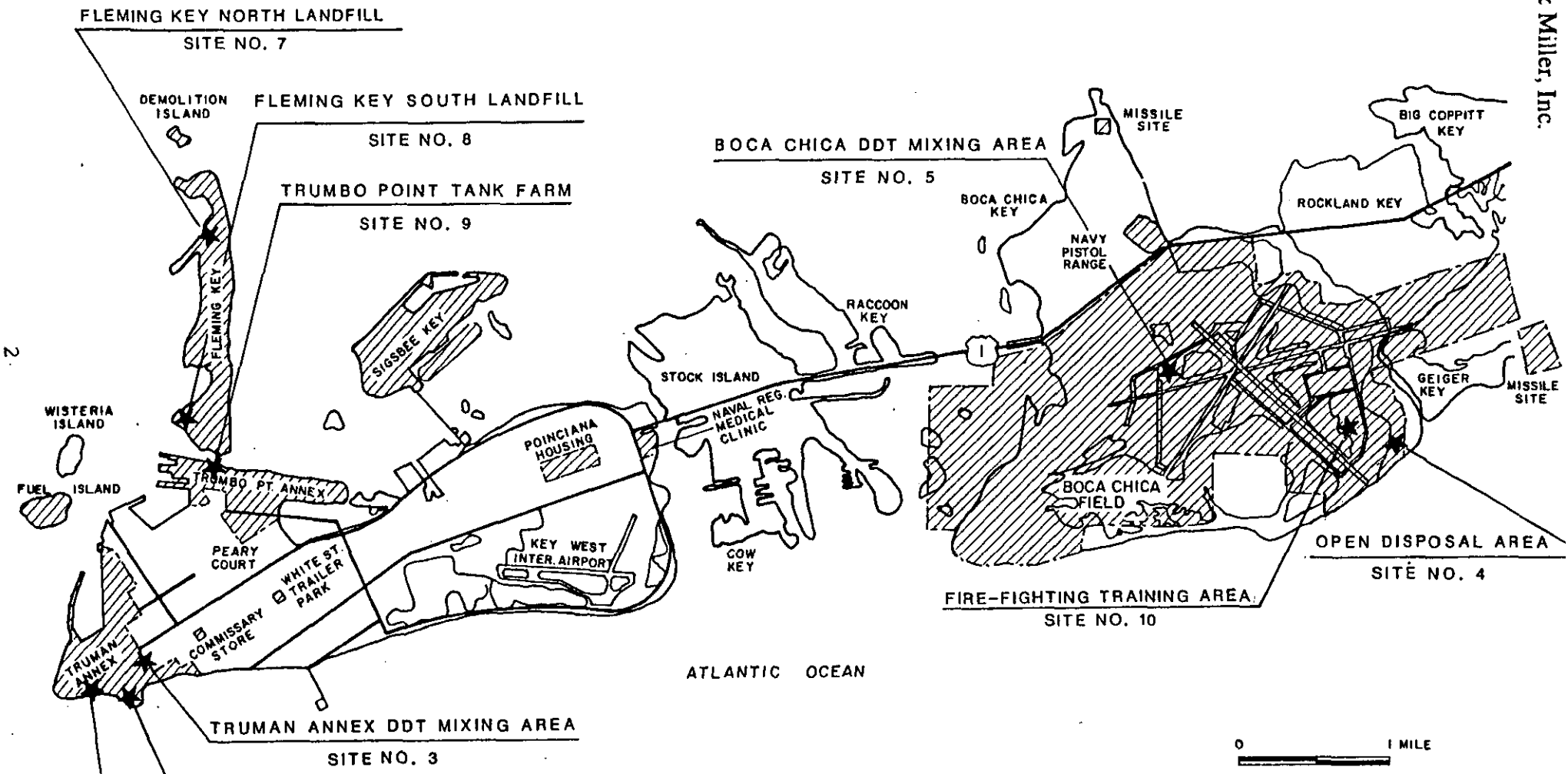

FIGURE 1. Site Map Showing Locations of Naval Activities and Study Sites.

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at Site No. 9, the results of which were presented in a report entitled: "Subsurface Hydrocarbon Investigation at Trumbo Point Annex, NAS - Key West." It was decided that the Fire-Fighting Training Area would be added during the site visit in October, due to the presence of hydrocarbon-stained soil in this area.

The site-specific investigations will be performed during the second phase of the NACIP program called the Confirmation Study. This Plan of Action discusses the verification phase of the Confirmation Study in which the presence or absence of contamination at a particular site is verified. Proposed activities at the sites, listed in Table 1, includes soil boring/monitor-well installation, soil sampling, water-level measurements, and ground-water quality sampling. The findings of the verification phase will be used to evaluate the potential impacts to the environment or public health from each site. Ultimately, each site will be either discarded from future study or recommended for additional study in the second phase of the Confirmation Study (characterization phase).

TABLE 1. PROPOSED WORK PLAN FOR VERIFICATION STUDY AT THE NAS-KEY WEST

SITE NAME AND NUMBER	TYPE OF WASTE MATERIAL	PROPOSED MONITOR WELLS	CHEMICAL ANALYSIS[1/] GROUND WATER	SOIL (Quantity)	COMMENTS
Refuse Disposal Area (Site No. 1)	construction debris, wood, waste oil, hydraulic fluid (possibly paint thinner and solvents)	4	EPA Priority Pollutants[2/] TDS[3/]	-	Full EPA Priority Pollutant Scan performed on initial sampling only.
Transformer Oil Disposal Area (Site No. 2)	waste transformer oil (dielectric fluid)	-	-	PCB(18)	Six composite samples of 3-4 subsamples collected at 3 depths.
Truman Annex DDT Mixing Area (Site No. 3)	DDT			Pesticides (18)[4/]	Six composite samples of 3-4 subsamples collected at 3 depths
Open Disposal Area (Site No. 4)	waste oil, hydraulic fluids, paints, thinners, solvents	4	EPA Priority Pollutants, TDS		Full EPA Priority Pollutant Scan performed on initial sampling only.
Boca Chica DDT Mixing Area (Site No. 5)	DDT			Pesticides (18)[5/]	Six composite samples of 3-4 subsamples collected at 3 depths
Fleming Key North Landfill (Site No. 7)	general refuse, DDT, malathion, diesel oil	4	EPA Prioriy Pollutants, TDS		Full EPA Priority Pollutants Scan performed on initial sampling only.
Fleming Key South Landfill (Site No. 8)	general refuse, sewage sludge, waste oil, hydraulic fluid, paint, thinner and solvents	5	EPA Priority Pollutants, TDS		Full EPA Priority Pollutants Scan performed on initial sampling only.
Trumbo Point Tank Farm (Site No. 9)	fuels-diesel, No. 6 fuel oil	6 (15 soil borings)	BTX[6/] Base/Neutral Extractable, TDS (10)		Some of the existing wells will be abandoned by pulling well casing, reaming the borehole and filling with grout. New monitor well locations will be dependent on findings of drilling program.
Fire-Fighting Training Area (Site No. 10)	waste oil, diesel, JP-5	2 (10 soil borings)	VOCs, PCBs, TDS		The 10 soil borings will be installed prior to determining well locations

NOTES:

1/ Water-quality samples will be analyzed in the field for temperature, pH, and specific conductance.

2/ EPA Priority Pollutant analysis will consist of:
Volatile organic compounds (EPA Method 624)
Acid and base/neutral extractable compounds (EPA Method 625)
Pesticides and PCB's (EPA Method 608)
Metals: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc.
Cyanide.

3/ TDS means total dissolved solids.

4/ Pesticides means those quantifiable by EPA Method 608 and listed in Table 6.3 of the IAS report.

5/ Pesticides means those quantifiable by EPA Method 608 and listed in Table 6.4 of the IAS report.

6/ BTX means aromatic hydrocarbons (benzene, toluene, xylene, and ethyl benzene) quantifiable by EPA Method 602.

PLAN-OF-ACTION

On-Site Investigation

Site No. 1: Refuse Disposal Area

This site, shown in Figure 2, is located along the south shore of Truman Annex on Key West in the general proximity of the current antenna field. It was used from 1952 until the mid-1960's as a general refuse disposal and open burning area. Combustible wastes such as telephone poles, tree clippings, paper, etc., were taken to this site and burned. Waste liquids including waste oil and hydraulic fluids, were used to help ignite the wastes. Due to the nature of the refuse collection, the wastes taken to be burned could have included shop wastes such as waste paints, thinners and solvents. Since the burning operation was not a controlled process, all the wastes may not have been completely destroyed.

Four shallow (less than 20 ft in depth) monitor wells will be installed at locations shown in Figure 2. Ground-water samples will be collected from these wells and analyzed for total dissolved solids (TDS) and EPA (Environmental Protection Agency) priority pollutants including volatile organic compounds (VOCs), acid and base neutral extractable compounds (A&B/N), pesticides, polychlorinated biphenyls (PCBs), metals, and cyanide.

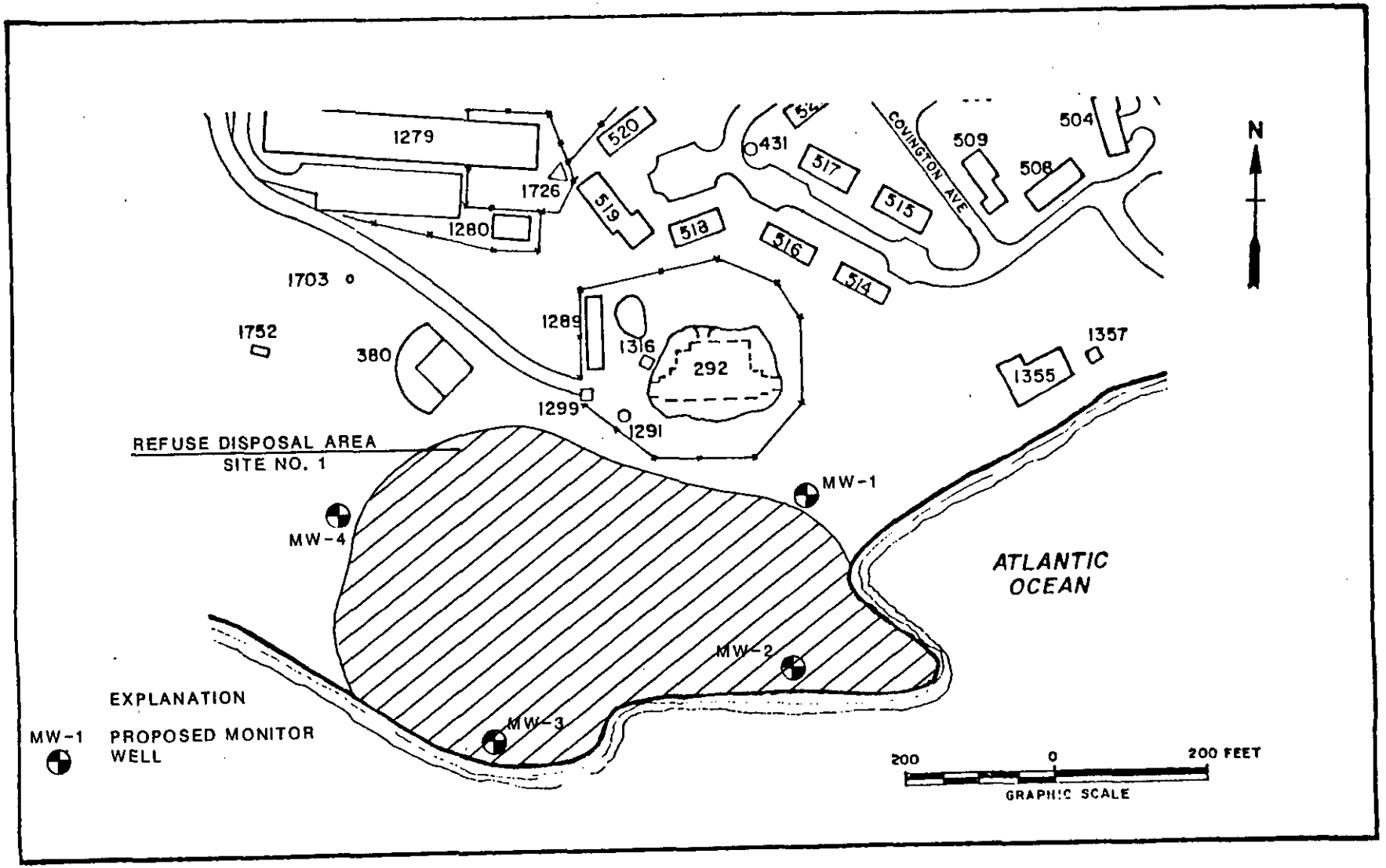

FIGURE 2. Site Plan Showing Monitor Well Locations at the Refuse Disposal Area (Site No. 1).

Site No. 2: Transformer Oil Disposal Area

This site is located in the gravel parking area surrounding the Defense Property Disposal Office (DPDO), Building 795, as shown in Figure 3. During the mid-1950's to approximately 1970, off-line transformers were sent to the Key West Naval Station DPDO at Truman Annex for ultimate disposal. Reportedly, transformers were lifted by a forklift truck and punctured near the bottom to allow the dielectric fluid to drain. The truck drove back and forth over the gravel parking area spreading the oil to control dust and weeds over approximately 0.5 acres surrounding Bu[illegible]. During this time, polychlorinated biphenyl (PCB) oil was in common use.

Accordingly, six composite soil samples, consisting of 3 to 4 subsamples, will be collected at three depths, 0-1, 1-2, and 2-3 ft (feet) in order to obtain representative samples of this area. The samples will be analyzed for PCBs.

Site No. 3: Truman Annex DDT Mixing Area

This site, shown in Figure 4, is located at the former site of a demolished building (No. 265). It was used as a DDT mixing area from the 1940's to the early 1970's. Powdered DDT concentrate was mixed with water in 55-gallon drums and stored until it was sprayed by a small tank truck. Reportedly, disposal at this site was not intentional but due

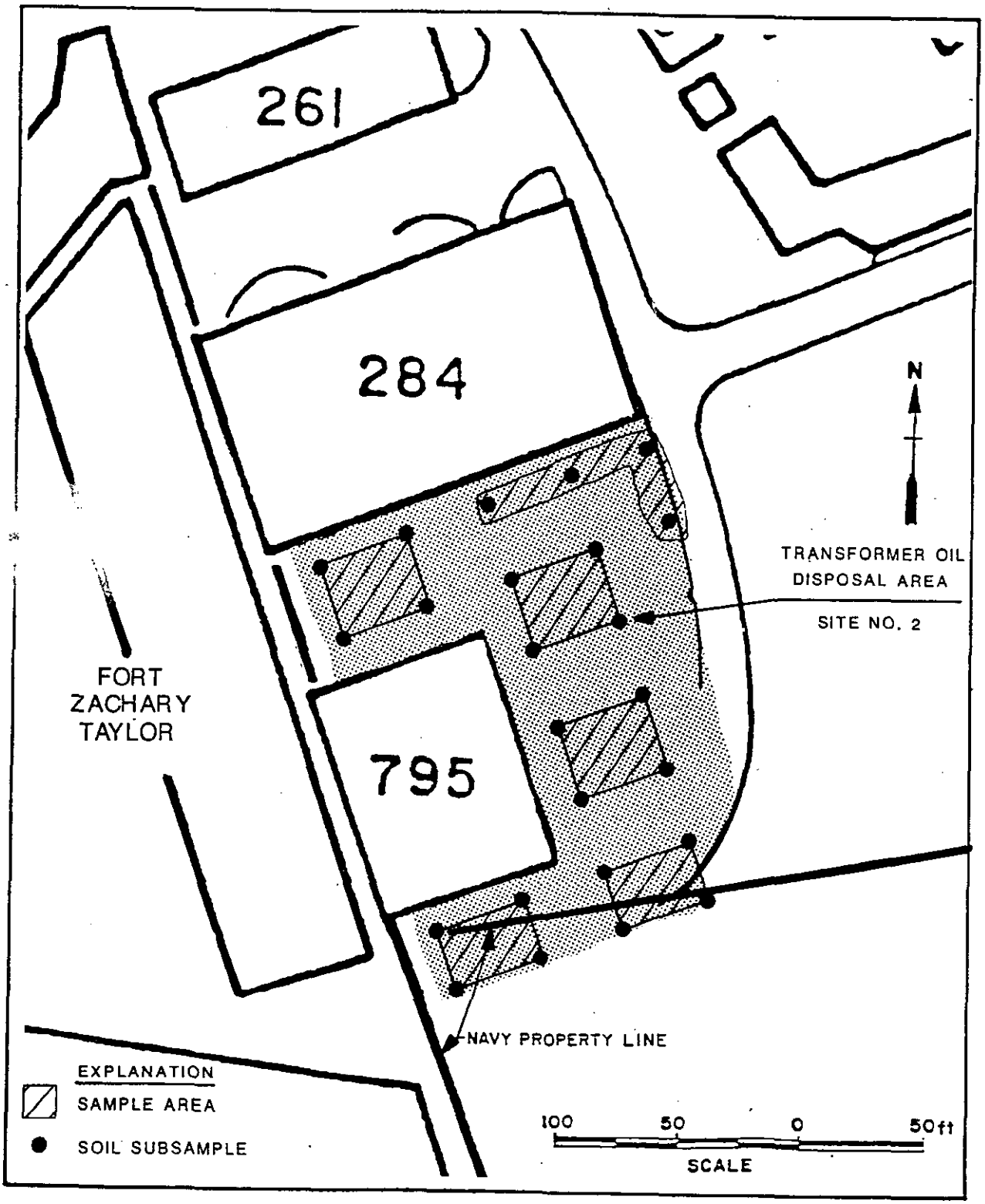

FIGURE 3. Site Plan Showing Soil Sampling Locations at the Transformer Oil Disposal Area (Site No. 2).

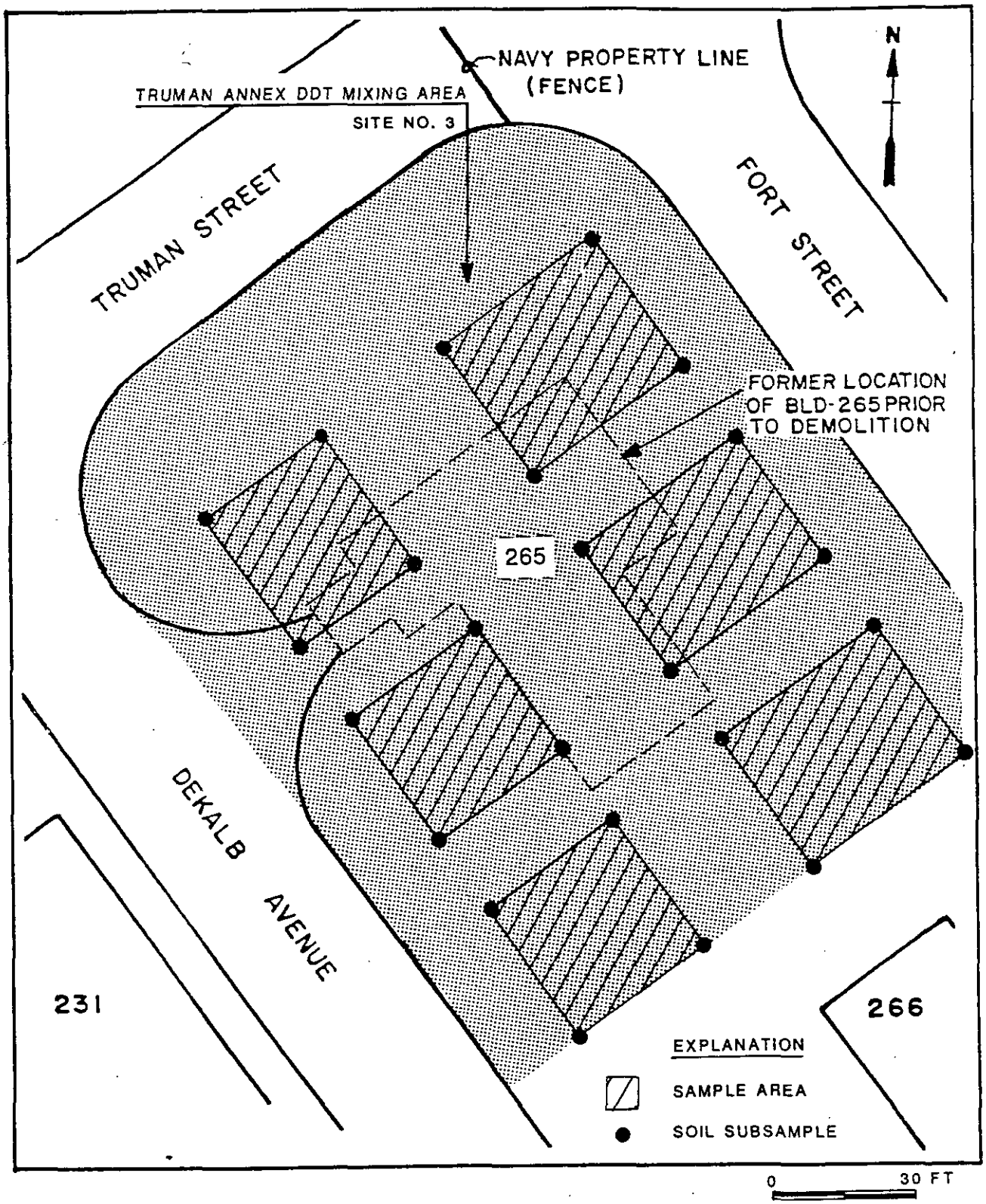

FIGURE 4. Site Plan Showing Soil Sampling Locations at the Truman Annex DDT Mixing Area (Site No. 3).

to accidental spillage during mixing and filling operations. This area is currently a non-posted, vacant lot.

Again, six composite soil samples consisting of 3 to 4 subsamples will be collected at three depths, 0-1, 1-2, and 2-3 ft. The samples will be analyzed for priority pollutant pesticides including DDT (dichlorodiphenyl trichloroethane).

Site No. 4: Open Disposal Area

The southeastern portion of Boca Chica Key, shown in Figure 5, between the perimeter road and Geiger Creek, was operated as an open disposal area, from 1942 when the NAS was first established on Boca Chica, until the area was closed in the mid-1960's. This site received all the wastes generated at NAS which consisted primarily of general refuse and waste associated with the operation and maintenance of aircraft operated by the squadrons and Aircraft Intermediate Maintenance Department (AIMD). These wastes might have included waste oils, hydraulic fluids, paint thinners and solvents not taken to the Fire-Fighting Training Area (Site No. 10). During the period of operation, approximately 2,600 tons of waste from the NAS were disposed at the site annually. The site was operated as an open disposal and burning area. Waste were disposed on the ground and burned daily if wind conditions permitted. Since the burning operation was not a controlled process, all waste may not have been completely destroyed. Three abandoned tanks are located in the northwest area of the site. The sides,

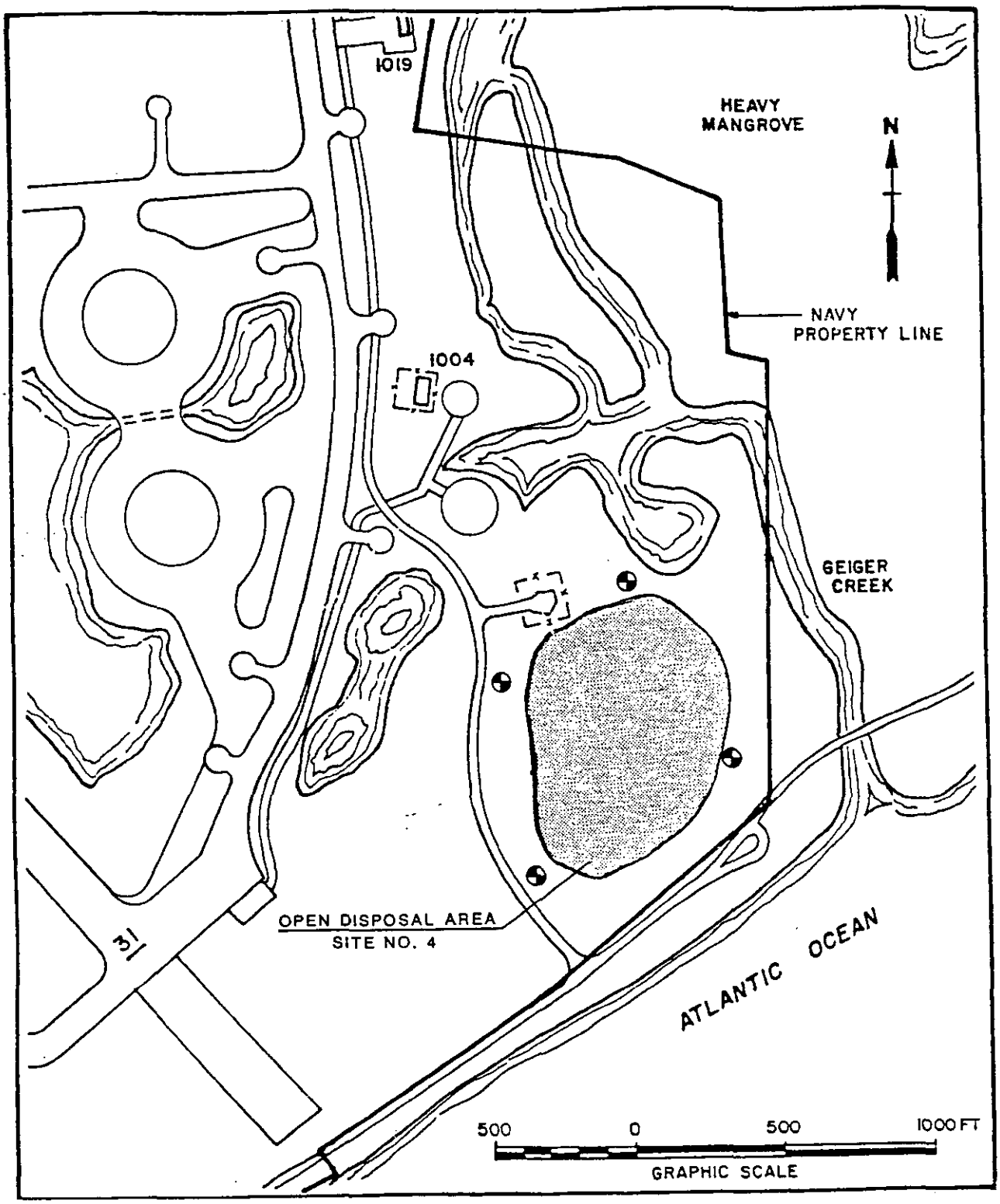

FIGURE 5. Site Plan Showing Location of Open Disposal Area (Site No. 4).

foundations and ground around the tanks were covered with an unknown black tar-like substance.

Four shallow monitor wells will be installed at locations shown in Figure 5. Water-quality samples will be collected from the wells and analyzed for TDS and EPA priority pollutants. Also, the contents of the abandoned tanks will be analyzed for PCBs and Extraction Procedure (EP) Toxicity (metals).

Site No. 5: Boca Chica DDT Mixing Area

This site (Figure 6) is approximately 0.25 acre in size and located near a canal draining to a large borrow pit along the west side of runway 13. The DDT mixing operations were conducted in Building 915 (subsequently demolished around 1982) from the 1940's to the early 1970's. Disposal at this site was not intentional, but instead would have resulted from accidental spillage of the mixed solution and concentrates. Two above-ground tanks on concrete foundations were located just outside and to the west of the building; one was a 500-gallon mixing tank and the other a 1,000-gallon storage tank. During removal of the tanks, some spillage occurred. A small amount of building demolition debris (such as pieces of wood, scrap metal and concrete chunks) is all that remains at the site.

Six composite soil samples, consisting of 3 to 4 subsamples will be collected at three depths 0-1, 1-2, and

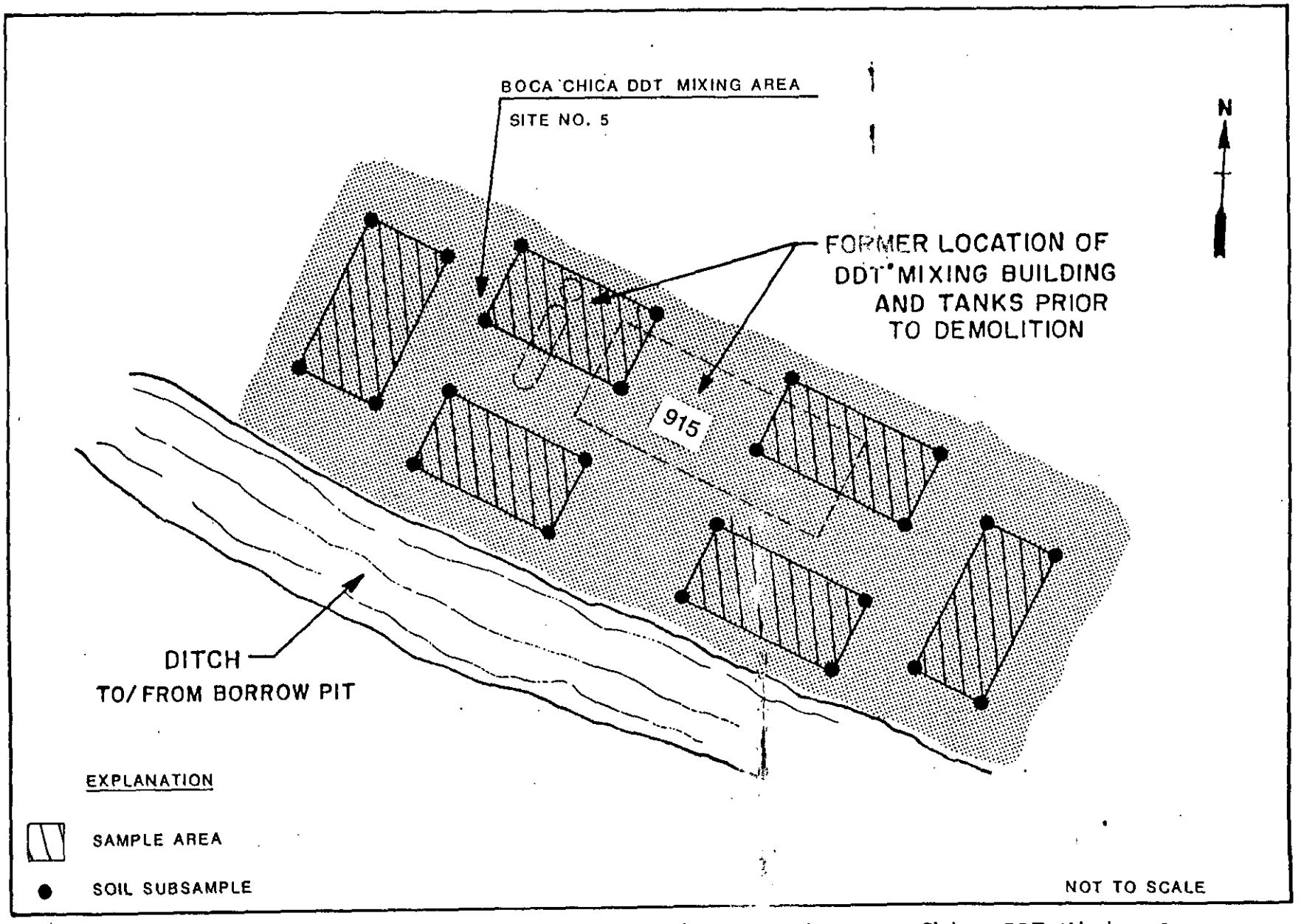

FIGURE 6. Site Plan Showing Soil Sampling Locations the Boca Chica DDT Mixing Area (Site No. 5).

2-3 ft. The samples will be analyzed for pesticides including PCBs.

Site No. 7: Fleming Key North Landfill

This site, which covers an area of approximately 30 acres, is located on the northern end of Fleming Key, as shown in Figure 7. The area was used as a landfill for Naval Station wastes for a ten year period from 1952 to 1962. Reportedly, 4,000 to 5,000 tons of waste from the Naval Station was disposed at the landfill annually during this . The actual type of waste disposed at this site is unknown.

The open trench method was used for the landfill operation; the trenches were approximately 25 ft wide, 10 ft deep and 500 to 1,000 ft in length. Burning was not done at this site. The trenches, which typically contained about 3 ft of sea water in the bottom, were covered at the end of each working day. The loose material from the next trench was used to cover the completed trench. Malathion, DDT, and diesel oil were sprayed at the landfill to control pests and insects.

In 1977, the U.S. Department of Agriculture Animal Import Center was constructed over a portion of the landfill. During construction of the Center, wastes were excavated and transferred to an area to the immediate west. This created a mounded area which is approximately 4 ft above the

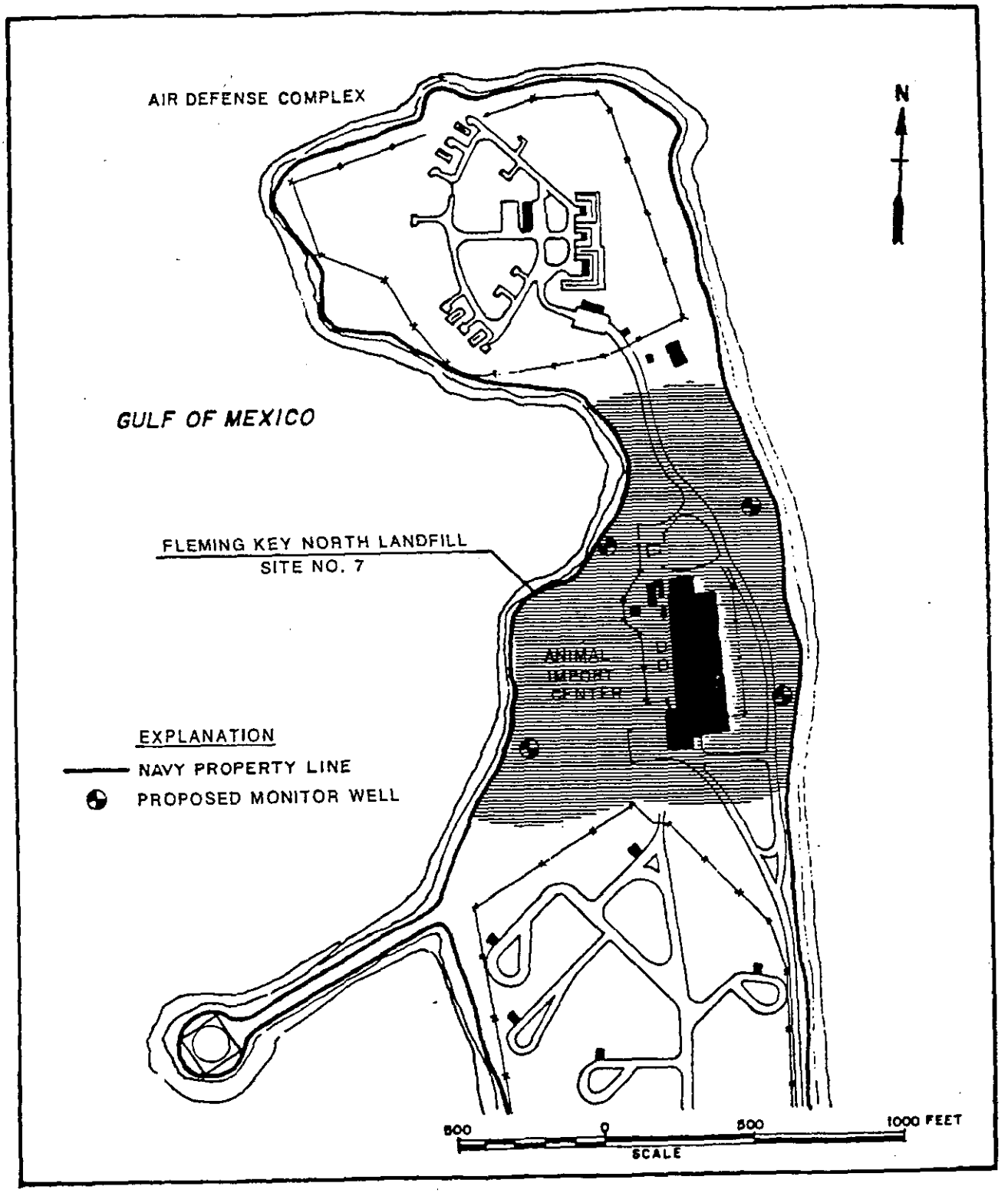

FIGURE 7. Site Plan Showing Location of Fleming Key North Landfill (Site No. 7).

surrounding land surface. In constructing the Animal Import Center an impermeable clay and synthetic liner were installed under the building and gas vents drilled to prevent the build-up of methane gas in the building.

Four shallow monitor wells will be installed at locations shown in Figure 7. Water-quality samples will be collected from these wells and analyzed for TDS and EPA priority pollutants.

Site No. 8: Fleming Key South Landfill

This site, which covers an area of approximately 45 acres, is located on the southern portion of Fleming Key. This area, shown in Figure 8, was operated as a landfill from 1962 until 1980. From 1962 to 1966, it is estimated that approximately 4,000 to 5,000 tons of waste from the Naval Station were disposed at the landfill annually. Beginning in 1966, the public works activities of NAS - Key West were combined with the Naval Station. At this time, the wastes from the NAS - Boca Chica also began being disposed at this site increasing the annual amount of waste disposed at the site to approximately 8,000 tons. Typical wastes disposed at the site primarily included general refuse from the Naval and Air Stations, although sewage sludge, waste oil, hydraulic fluid, paint, paint thinner and solvents from the Air Station shops were likely disposed at this landfill. The open trench disposal method was also practiced at this landfill with the trenches being constructed in a manner similar to Site No. 7.

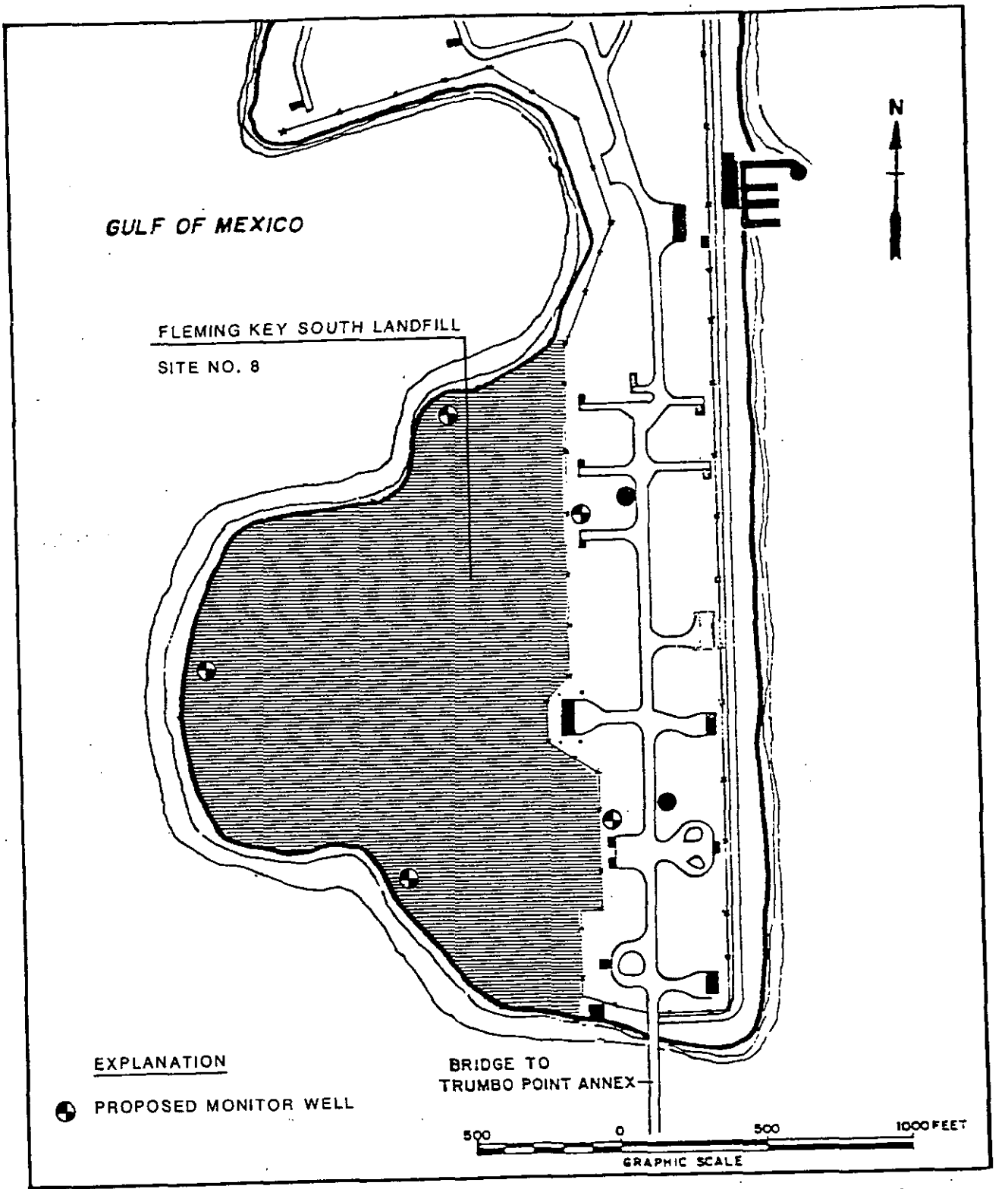

FIGURE 8. Site Plan Showing Location of Fleming Key South Landfill (Site No. 8).

The trenches were also partially filled with sea water when the wastes were disposed. Wet garbage was placed directly into one end of the trench while other wastes were taken to the western portion of the site and burned. The ashes and unburned portions of the wastes were then placed into the remainder of the trench. DDT, malathion and diesel oil were sprayed at the landfill to control pests and insects.

Five shallow monitor wells will be installed at locations shown in Figure 8. Water-quality samples will be collected from these wells and analyzed for TDS and EPA priority pollutants.

Site No. 9: Trumbo Point Tank Farm

The tank farm is located immediately east of the piers at the Trumbo Point Annex, as shown in Figure 9. This Annex was constructed in 1918 as a seaplane base from materials dredged during construction of the seaplane runways. Fuel used for both ships and aircraft at the NAS-Key West is received at this facility from tankers and then distributed via buried transmission lines to either Truman Annex or NAS-Boca Chica. A variety of fuel has been stored at this tank farm including No. 6 fuel oil (Bunker C has not been used since 1973), diesel, aviation gasoline, JP-4 (replaced by JP-5 in 1975), and JP-5. Presently, only diesel fuel and JP-5 are stored at this site. The Navy has issued a work plan in 1985 to demolish several storage tanks which previously contained No. 6 fuel oil and aviation gasoline.

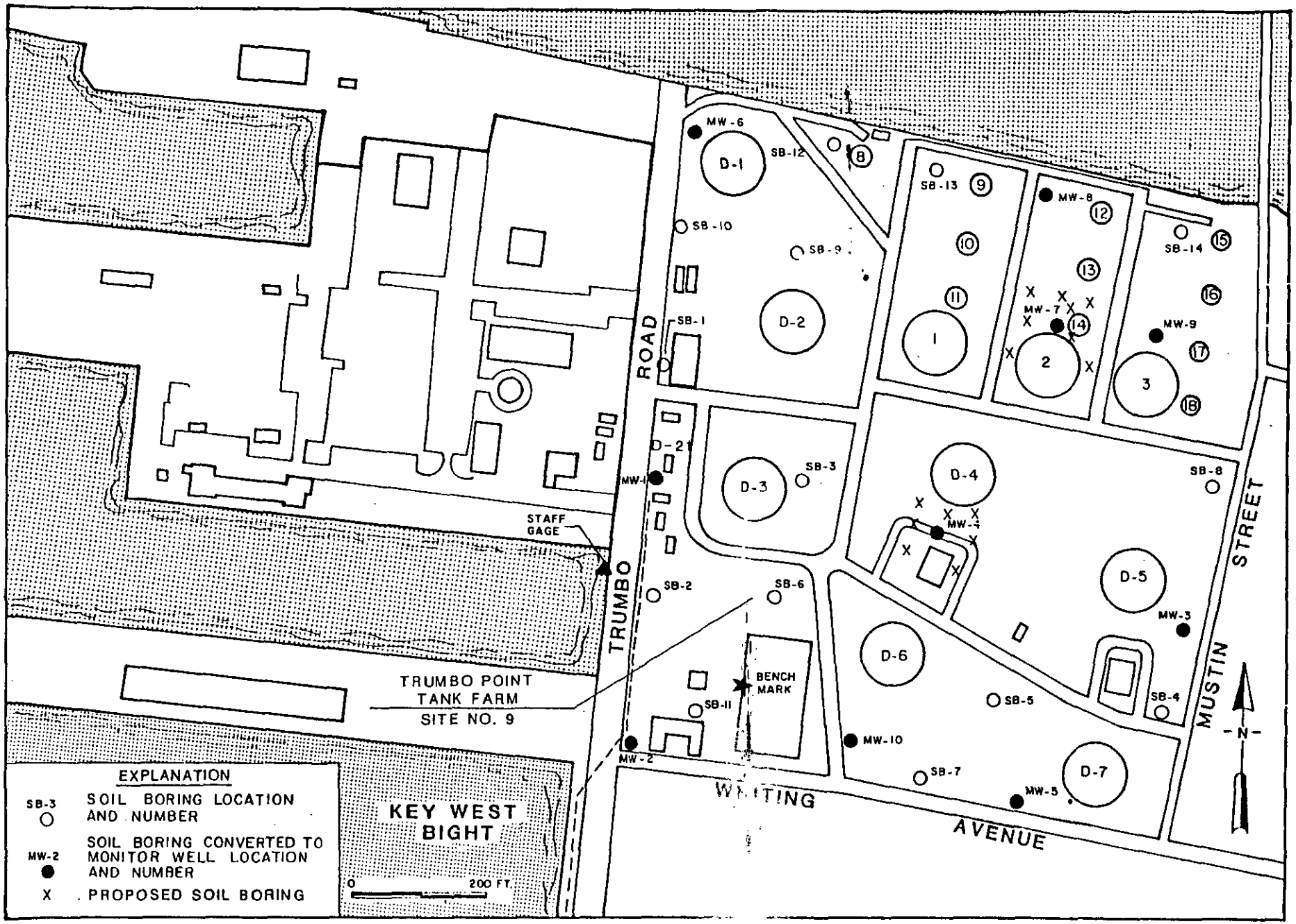

FIGURE 9. Site Plan Showing Location of Trumbo Point Tank Farm (Site No. 9).

G&M conducted a preliminary hydrogeologic investigation at this site to determine the presence or absence of hydrocarbons in the subsurface. During the study, 10 shallow monitor wells were installed at locations shown in Figure 9; free or undissolved hydrocarbons were detected in two of these wells (MW-4 and MW-7).

Accordingly, an expanded field progam to better define the horizontal extent of free hydrocarbons was recommended. During the verification study, 15 additional soil borings and w monitor wells will be installed. The new monitor well locations will be estimated in the field based on the findings of this expanded program. Six water-quality samples will be collected from selected wells and analyzed for aromatic hydrocarbons (benzene, toluene, xylene, and ethyl benzene) and base/neutral extractable compounds and 10 samples will be analyzed for TDS. Some of the existing monitor wells will be abandoned by pulling the well casing, reaming the borehole, and filling this hole with cement grout. Also, the ground water from existing monitor well MW-1 will be analyzed for VOCs, acid and base/neutral extractable compounds due to its proximity to a tank (D-21) presently used for storage of hazardous wastes.

Site No. 10: Fire-Fighting Training Area

This site, shown in Figure 10, is located immediately west of the blimp pads near Site No. 4. The site occupies an area approximately 100 ft x 100 ft and contains junk vehicles

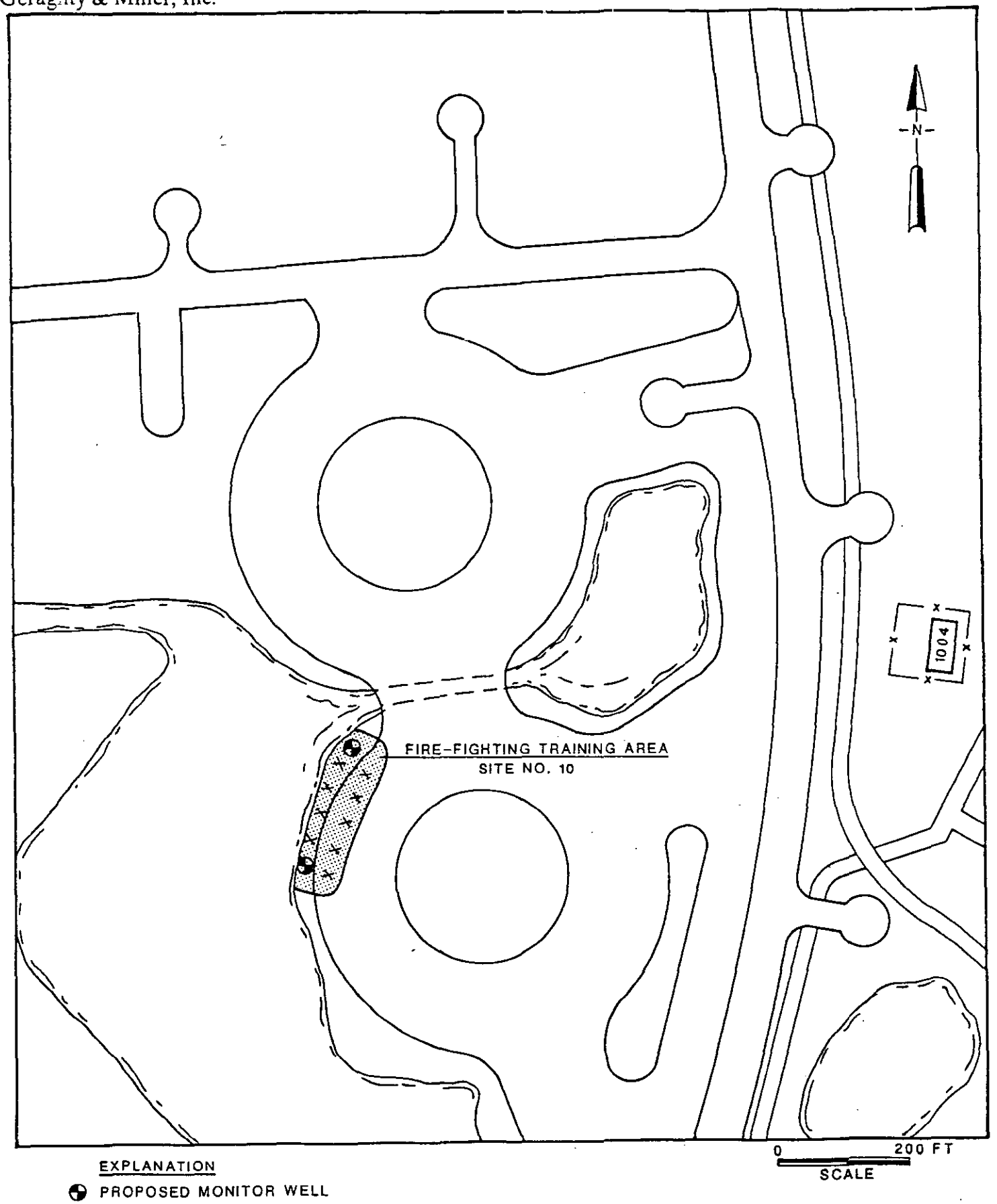

FIGURE 10. Site Plan Showing Location of Fire-Fighting Training Area (Site No. 10).

and aircraft which are used for fire-fighting training. These vehicles are ignited using JP-5, waste oils, or hydraulic fluids as fuel. The area surrounding these vehicles shows visible evidence of fire damage and oils not completely consumed by the fire.

Ten soil borings and two shallow monitor wells will be installed at locations shown in Figure 10. Water-quality samples will be collected and analyzed for VOCs and PCBs.

Data Analysis and Report Preparation

The data collected will be compiled into a written report. Figures and tables will be used to show well construction details, the results of the chemical analyses, and the locations of the samples collected. These figures and tables will be supported by text which will describe the work performed, monitor-well construction procedures, sampling and analysis methods, direction of ground-water flow, and sediments encountered.

An assessment of the potential for public health and environmental effects will be addressed including known toxicity information on contaminants found and applicable rules and regulations regarding their presence in soil sediments and/or ground water/surface water. Recommendations will be presented regarding the exclusion of selected sites

from further investigation or the need for additonal field information to better define conditions at other sites.

Respectfully submitted,

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